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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,079	02/20/2004	Fred Grunert	GK-OEH-179/500814.20081	6268
26418	7590	10/19/2005	EXAMINER KO, TONY	
REED SMITH, LLP ATTN: PATENT RECORDS DEPARTMENT 599 LEXINGTON AVENUE, 29TH FLOOR NEW YORK, NY 10022-7650			ART UNIT 2878	PAPER NUMBER

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/783,079	Applicant(s) GRUNERT ET AL.	
	Examiner Tony Ko	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 2, 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Vincent (U.S. Patent 5,272,518).

3. Regarding claims 1, 2, and 6, Vincent discloses a photo sensor for color measurement based on three spectral components comprising: an interference filter structure (17); a sensor chip having at least three partial surfaces (19) of different sensitivities for detecting the three spectral components through said interference filter (Col. 6, Lines 45-53); structure which precedes said sensor chip partial surfaces; said interference filter structure containing three different alternating layer systems of silicon dioxides and titanium dioxide for selective transmission of incident light into the different partial surfaces of the sensor chip (Col. 20 Line 59 – Col. 21 lines 1-33); said partial surfaces providing measurement values in response to said selectively transmitted incident light (Col. 8, Lines 45-55); said three partial surfaces covered by different interference filters of said filter structure being adapted to the spectral characteristic of the human eye; said partial surfaces being arranged so as to be distributed in a sector-shaped manner around a central point with passive webs located therebetween; and each interference filter having a transmission characteristic over the wavelength of the

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light to be measured spectrally being adapted to the response of the human eye in such a way that the product of the base sensitivity of the photosensor and the transmission of the interference filter is proportional to the normal spectral value curve of the human eye for the relevant coordinate of the color space, so that the passed spectral components generate measurement values in the partial surfaces, which measurement values can be converted into spectral color values with simple scaling relative to one another in the color space. Vincent also discloses the transmission characteristic for each partial surface of the sensor chip having different sensitivities with different layer thicknesses of TiO<sub>2</sub> and SiO<sub>2</sub>. Since the 2% tolerance adds no structural difference, Vincent inherently discloses the limitation in claim 2. Vincent also discloses the interference filters are arranged directly on semiconductor diodes of the sensor chip (col. 29, Lines 61-65).

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent in view of Delignieres (U.S. Patent 5,680,220).

6. Regarding claim 3, Vincent discloses the invention set forth above. Vincent does not disclose a linear correction method. Delignieres discloses (Col. 5, Lines 1-10) a

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linear correction method. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use linear correction method to correct the incorrect values.

7. Regarding claims 3-5, Vincent in view of Delignieres discloses the invention set forth above. Claims 4 and 5 show no criticality (claim 4 shows non local and claim 5 shows local matrixing is the proof of the lack of criticality). It would have been obvious to a person of ordinary skill in the art at the time of the invention to use local or non-local matrixing to properly implement linear correction.

8. Claims 7-9 and 12, 13 and 15, as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent.

9. Regarding claim 7, Vincent discloses the invention set forth above; Vincent does not disclose the semiconductor diodes are made of silicon. It is well known to make semiconductor diodes with Si. It would have been obvious to a person of ordinary skill in the art at the time of the invention to make semiconductor diodes with Si to reduce the production cost.

10. Regarding claim 12, Vincent discloses the invention set forth above; Vincent does not disclose the filters are arranged over the semiconductor diodes of the sensor chip on a separate glass plate. It is design choice to place the filters over the semiconductor diodes of the sensor chip on a separate glass plate. It would have been obvious to a person of ordinary skill in the art at the time of the invention to place the filters over the semiconductor diodes of the sensor chip on a separate glass plate to secure the location of the filter.

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11. Regarding claims 13 and 15, Vincent discloses the invention set forth above; Vincent does not disclose altering the shape of the filters. It is design choice to alter the filter shape to a third of a circle or rhombuses with a 120-degree angle. It would have been obvious to a person of ordinary skill in the art at the time of the invention to change the shape of the filter to enable the detector to receive desired light wavelength and intensity.

12. Regarding claims 8 and 9, Vincent discloses the invention in claim 8 and 9 since claims 8 and 9 does not add no structural differences between claimed invention in 7.

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent in view of Auth (U.S. Patent Re. 32,821).

14. Regarding claim 10, Vincent discloses the invention set forth above, Vincent does not disclose the use of a germanium diode. Auth discloses (Fig. 16) the use of a germanium diode. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use germanium diode to drop off the unwanted spectrum contents.

15. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent in view of Turner (U.S. Patent 6,707,556).

16. Regarding claim 11, Vincent discloses the invention set forth above, Vincent does not disclose InGaAs diode. Turner discloses the use of InGaAs diode. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use to reduce dark current.

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17. Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jie (U.S. Patent 6,133,954) in view of Hanrahan (U.S. Patent 5,246,803).

18. Regarding claim 1-3 and 6, Jie discloses (Fig. 4H) a photo sensor (42) for color measurement based on three spectral components comprising: an interference filter structure; a sensor chip having at least three partial surfaces of different sensitivities for detecting the three spectral components through said interference filter structure which precedes said sensor chip partial surfaces; said interference filter structure containing three different alternating layer systems for selective transmission of incident light into the different partial surfaces of the sensor chip; said partial surfaces providing measurement values in response to said selectively transmitted incident light; said three partial surfaces (the surface of 42 A, B, C, D) covered by different interference filters (48'', 49'', and 50'') of said filter structure being adapted to the spectral characteristic of the human eye; said partial surfaces being arranged so as to be distributed in a sector-shaped manner around a central point with passive webs located therebetween; and each interference filter having a transmission characteristic over the wavelength of the light to be measured spectrally being adapted to the response of the human eye in such a way that the product of the base sensitivity of the photo sensor and the transmission of the interference filter is proportional to the normal spectral value curve of the human eye for the relevant coordinate of the color space, so that the passed spectral components generate measurement values in the partial surfaces, which measurement values can be converted into spectral color values with simple scaling relative to one another in the color space. Jie also discloses the interference

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filters are arranged directly on semiconductor diodes of the sensor chip. Jie also discloses (5C) the partial surfaces on the sensor chip which are covered with adapted interference filters and have different sensitivity (R, B and G colors) are arranged around a central point as sectors of a circle area with different surface contents, wherein the different surface contents are adapted in such a way that a lower base sensitivity of one partial surface which comes about because of limited wavelength transmission of the respective interference filter is compensated by a correspondingly greater surface content of the partial surface of the photosensor. Jie also discloses the sensor chip to be uniformly distributed around a plurality of central points with identical webs, so that the tricolor segments are arranged in a honeycombed manner (Fig. 6), wherein partial surfaces having identical spectral response do not share any adjacent lateral edges. Jie does not disclose the use of silicon dioxide and titanium dioxide as the layer content. Hanrahan discloses (Col. 3, Lines 66-67) the use of silicon dioxide and titanium dioxide layers. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use silicon dioxide and titanium dioxide layers to precisely filter out the unwanted light.

19. Regarding claim 2, Jie in view of Hanrahan discloses the invention set forth above. Since the 2% tolerance of the layer thicknesses has no structural difference from the invention set forth above, claim 2 is rejected.

20. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan further in view of Delignieres.

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21. Jie in view of Hanrahan discloses the invention set forth above, Jie in view of Hanrahan does not disclose the use of linear correction. Delignieres discloses the use of linear correction. . It would have been obvious to a person of ordinary skill in the art at the time of the invention to use linear correction method to correct the incorrect values.

22. Regarding claims 4-5, Jie in view of Hanrahan further in view of Delignieres discloses the invention set forth above. Since claims 4 and 5 shows no criticality (claim 4 shows non local and claim 5 shows local matrixing is the proof of the lack of criticality), claims 4 and 5 are rejected.

23. Claims 7-9 and 12, as understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan.

24. Regarding claim 7, Jie in view of Hanrahan discloses the invention set forth above; Jie in view of Hanrahan does not disclose the semiconductor diodes are made of silicon. It is well known to make semiconductor diodes with Si. It would have been obvious to a person of ordinary skill in the art at the time of the invention to make semiconductor diodes with Si to reduce the production cost.

25. Regarding claim 12, Jie in view of Hanrahan discloses the invention set forth above; Jie in view of Hanrahan does not disclose the filters are arranged over the semiconductor diodes of the sensor chip on a separate glass plate. It is design choice to place the filters over the semiconductor diodes of the sensor chip on a separate glass plate. It would have been obvious to a person of ordinary skill in the art at the time of

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the invention to place the filters over the semiconductor diodes of the sensor chip on a separate glass plate to secure the location of the filter.

26. Claims 13, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan in view of Mathies (U.S. Patent 6,867,420).

27. Regarding claims 13, 15 and 16, Jie in view of Hanrahan discloses the invention set forth above. Jie in view of Hanrahan does not disclose the partial surfaces on the sensor chip which are covered with adapted interference filters and have different sensitivity are shaped as thirds of a circle area and are arranged around a central point. Mathies discloses (Fig. 12) the partial surfaces on the sensor chip, which are covered with adapted interference filters and have different sensitivity, are shaped as thirds of a circle area and are arranged around a central point. It would have been obvious to a person of ordinary skill in the art at the time of the invention to have the partial surfaces on the sensor chip which are covered with adapted interference filters and have different sensitivity are shaped as thirds of a circle area and are arranged around a central point for the detectors to work under the desired light intensity.

28. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan in view of Auth (U.S. Patent Re. 32,821).

29. Regarding claim 10, Jie in view of Hanrahan discloses the invention set forth above, Jie in view of Hanrahan does not disclose the use of a germanium diode. Auth discloses (Fig. 16) the use of a germanium diode. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use germanium diode to drop off the unwanted spectrum contents.

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30. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan further in view of Turner (U.S. Patent 6,707,556).

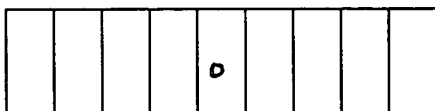
31. Regarding claim 11, Jie in view of Hanrahan discloses the invention set forth above, Jie in view of Hanrahan does not disclose InGaAs diode. Turner discloses the use of InGaAs diode. It would have been obvious to a person of ordinary skill in the art at the time of the invention to use to reduce dark current.

### ***Response to Arguments***

32. Applicant argues that "Vincent discloses more than three spectrally separated partial sensor surfaces and spectrally spread color values for deterring the color of the object", thus Vincent does not anticipate the "three spectral components" in claim 1.

Examiner disagrees. Vincent discloses <sup>a</sup>number of spectral components, which include at least three components, thus anticipates the three spectral components.

33. Applicant further argues, "Vincent does not disclose three alternating layer systems around an axis." The claim states "the partial surfaces being arranged so as to be distributed in a sector-shaped manner around a central point (see claim 1)." The figure below shows the Vincent partial surfaces being arranged around a central point. The point in the center of the partial surfaces clearly anticipates the limitation of the claim. That is, the partial surfaces are distributed in a sector shaped manner around a central point.





34. Applicant further argues “an interference filter having a transmission characteristic over the wavelength of the light to be measured spectrally being adapted to the response of the human eye”. Vincent discloses (Col. 8, Lines 60-65) that the filter 17 maybe more than three filters that “individually match the wavelength passing characteristics of a color sensor for the eye”. Therefore, Examiner disagrees with the applicant’s argument.

35. Regarding claims 2 and 6, applicant argues that the thickness of the layers would impact the overall result of the layers. Thus, the 2% tolerance would have an effect on the transmission characteristics. However, the transmission characteristics are merely the result of light passes through the structure, and the differences in the results is inherent due to differences in thickness of the layers. Since Vincent does not teach there should be tolerance for the thickness of the layers, the inherent thickness should have 0% of tolerance, which anticipates applicant’s claim.

36. Regarding claim 6, Examiner refers Column 29, Lines 60-65 in the Vincent patent. Vincent states, “The filter substrate or a set of filter substrates is mounted to the surface of the photoelement package.” That is, the filters are formed on top of photoelement package as shown in Figure 26A.

37. Claims 1-3 and 6 is unpatentable over Jie in view of Hanrahan. Applicant states “the triplets are not arranged in a position directly adjacent to the integrated chip”.

However, all the layers, as a whole, shown in figure 4H is considered as interference filter. The filter shown in Jie is the same as the filter shown in applicant's figure 1 element 2. Jie discloses a 120 degrees (Fig. 5A) and the Green, Blue and Red color filter, in combination, has the color sensitivity of the human eye.

### ***Conclusion***

38. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Ko whose telephone number is 571-272-1926. The examiner can normally be reached on Monday-Friday 7:30 - 4:00.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TKO

**THOMAS L. LU**  
**PATENT EXAMINER**